

AMENDMENTS TO THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

LISTING OF CLAIMS:

1-22. (Cancelled)

23. (New) A method of conferring on a textile material and/or threads, fibers and/or filaments constituting said textile material properties of water repellency and impermeability which are durable without substantially reducing the intrinsic respirability of said textile material, said method comprising coating said textile material and/or said threads, fibers or filaments with a crosslinkable liquid silicone formulation comprising:

A – a system for generating a film-forming silicone network containing at least one polyorganosiloxane (POS) resin exhibiting, per molecule, on the one hand at least two different siloxyl units selected from those of types M, D, T, Q, one of the units being a T unit or a Q unit, and on the other at least three hydrolyzable/condensable groups of types OH and/or OR¹ where R¹ is a C₁ to C₆ linear or branched alkyl radical;

B – a system promoting anchorage of said network to the surface of the textile material, consisting of

(i) either B-1 at least one metallic alkoxide with the general formula:



in which:

M is a metal selected from the group consisting of Ti, Zr, Ge, Si, Mn and Al;

n = valency of M;

the substituents R², identical or different, each represent a C₁ to C₁₂ alkyl radical, linear or branched;

a represents 0, 1 or 2;

with the conditions according to which, when the symbol a = 0, the alkyl radical R² has from 2 to 12 carbon atoms, and when the symbol a is 1 or 2, the alkyl radical R² has from 1 to 4 carbon atoms;

optionally, the metal M is linked to a ligand;

(ii) or B-2 at least one metallic polyalkoxide resulting from the partial hydrolysis of the monomeric alkoxides of formula (I) above, in which the symbol R² has the aforementioned meaning with the symbol a = 0 ;

(iii) or a combination of B-1 and B-2;

(iv) or B-3 a combination of B-1 and/or B-2 with:

(a) B-3/1 at least one optionally alkoxylated organosilane having, per molecule, at least one C₂-C₆ alkenyl group,

(b) and/or B-3/2 at least one organosilicic compound having at least one epoxy, amino, ureido, isocyanato and/or isocyanurate radical; and

C – a functional additive consisting of:

(i) either C-1 at least one silane and/or at least one essentially linear POS and/or at least one POS resin, each of said organosilicic compounds being equipped, per molecule, on the one hand with anchorage functions (AF) capable of reacting with A and/or B or capable of generating in situ functions capable of reacting with A and/or B and on the other with hydrophobicity function(s) (HF) which can be identical to or different from the AFs;

(ii) or C-2 at least one hydrocarbon compound containing at least one linear or branched, saturated or unsaturated hydrocarbon group and optionally one or more heteroatom(s) other than Si and present in the form of a monomeric, oligomeric or polymeric structure, said hydrocarbon compound being equipped, per molecule, on the one hand with anchorage function(s) (AF) capable of reacting with A and/or B or capable of generating in situ functions capable of reacting with A and/or B and on the other with hydrophobicity function(s) (HF) which can be identical to or different from the AFs;

(iii) or a mixture of C-1 and C-2; and

D – optionally a non-reactive additive system consisting of: (i) at least one organic solvent and/or one non-reactive organosilicic compound; (ii) and/or water; with the condition according to which there are employed (in parts given by weight):

per 100 parts of constituent A,
from 0.5 to 200 parts of constituent B,
1 to 1,000 parts of constituent C and
from 0 to 10,000 parts of constituent D,

wherein (i) the coating step is conducted in such a manner that the silicone formulation crosslinks around the threads, fibers and/or filaments constituting the textile material and forms around them a crosslinked silicone sheath, and (ii) this confers on said textile material water repellency and impermeability which are durable, without substantially reducing the intrinsic respirability of the textile material.

24. (New) A method according to claim 23, which confers on the textile material a beading effect of between 80 and 100 % according to the method Spray Test AATC Test Method 22-1996.

25. (New) A method according to claim 23, which confers on the textile material a beading effect of between 80 and 100 % according to the method Spray Test AATC Test Method 22-1996, said beading effect being maintained at a value of between 70 and 100 % after 8 hours of continuous washing by machine with water at 50 °C.

26. (New) A method according to claim 23, which confers on the textile material an impermeability to liquid water corresponding to a water column greater than or equal to 10 cm, as measured by the Schmerber test ISO Test Method 811-1981.

27. (New) A method according to Claim 26, wherein the water column is greater than or equal to 15 cm.

28. (New) A method according to Claim 27, wherein the water column is greater than or equal to 20 cm.

29. (New) A method according to claim 23, which confers on the textile material an impermeability to liquid water corresponding to a water column greater than or equal to 10 cm, as measured by the Schmerber test ISO Test Method 811-1981, said impermeability remaining greater than or equal to 10 cm, after 8 hours of continuous washing by machine with water at 50 °C.

30. (New) A method according to claim 29, wherein the water column is greater than or equal to 15 cm.

31. (New) A method according to claim 30, wherein the water column is greater than or equal to 20 cm.

32. (New) A method according to claim 23, which confers on the textile material in addition properties of reduced water absorption.

33. (New) A method according to claim 23, which confers on the textile material in addition properties of rapid drying.

34. (New) A method according to claim 23, wherein the coated textile material is suitable for the production of sportswear.

35. (New) A method according to claim 23, wherein the radical R¹ of constituent A is a C₁ to C₃ linear or branched alkyl radical.

36. (New) A method according to claim 23, wherein constituent A is a mixture A-3:

- (i) of at least one resin having, in its structure, at least two different siloxyl units selected from those of formula (R³)₃SiO_{0.5} (unit M), (R³)₂SiO (unit D) and R³SiO_{1.5} (unit T), at least one of said units being a T unit, the OH and/or OR¹

groups being optionally borne by the M, D and/or T units and the content by weight of OH and/or OR¹ groups lying between 0.2 and 10 wt %, and

- (ii) of at least one other resin having, in its structure, at least two different siloxyl units selected from those of formula (R³)₃SiO_{0.5} (unit M), (R³)₂SiO (unit D) and R³SiO_{1.5} (unit T) and SiO₂ (unit Q), at least one of said units being a Q unit, the OH and/or OR¹ groups being optionally borne by the M, D and/or T units and the content by weight of OH and/or OR¹ groups lying between 0.2 and 10 wt %,

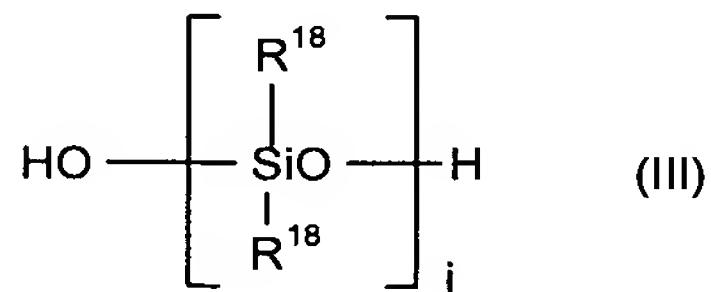
the R³ radicals present in said resins being identical or different and being selected from C₁-C₆ linear or branched alkyl radicals, C₂-C₄ alkenyl, phenyl, and 3,3,3 trifluoropropyl radicals.

37. (New) A method according to claim 23, wherein a constituent B-1 is employed containing an alkyl titanate, an alkyl zirconate, an alkyl silicate or a mixture of at least two of them, and/or wherein there is employed as constituent B-2 a polytitanate B-2 produced by the partial hydrolysis of isopropyl titanate, butyl titanate or ethyl-2-hexyl titanate, a polyzirconate B-2 produced by the partial hydrolysis of propyl and butyl zirconate, a polysilicate B-2 produced by the partial hydrolysis of ethyl and isopropyl silicate or a mixture of at least two of them.

38. (New) A method according to claim 37, wherein the constituent B-1 contains a compound selected from the group consisting of ethyl titanate, propyl titanate, isopropyl titanate, butyl titanate, ethyl-2-hexyl titanate, octyl titanate, decyl titanate, dodecyl titanate, β-methoxyethyl titanate, β-ethoxyethyl titanate, β-propoxyethyl titanate, titanate of formula Ti[(OCH₂CH₂)₂OCH₃]₄, propyl zirconate, butyl zirconate, methyl silicate, ethyl silicate, isopropyl silicate, and n-propyl silicate and a mixture of at least two of them.

39. (New) A method according to claim 23, wherein a constituent C-1 is employed containing:

(i) an essentially linear diorganopolysiloxane having a hydroxyl group at each chain end, with the formula:



in which:

- (a) the substituents R^{18} , identical or different, each represent a C_1 to C_{13} saturated or unsaturated monovalent hydrocarbon radical, substituted or non-substituted, aliphatic, cyclic or aromatic;
- (b) j has a value sufficient to confer on the diorganopolysiloxane of formula (III) a dynamic viscosity at 25 °C ranging from 50 to 10,000,000 mPa.s;
- (ii) a hydroxylated POS resin having in its structure siloxyl units T and optionally M and/or optionally D;
- (iii) a hydroxylated POS resin which may be obtained:
 - (a) by hydrolysis of an alkoxy silane S substituted by HF_s;
 - (b) by homocondensation of the hydrolysed silanes S;
 - (c) and by stripping of the hydrolysates derived from the HF_s;
- (iv) a mixture of at least two of the compounds (i), (ii) and (iii).

40. (New) A method according to claim 39, wherein a hydroxylated MDT resin having a content by weight of group OH of between 0.2 and 10 wt % is employed.

41. (New) A method according to claim 23, wherein a fluorinated alcohol is employed as constituent C-2.

42. (New) A method according to claim 41, wherein said fluorinated alcohol is a perfluorinated alcohol of the formula:



where R¹⁹ represents an aliphatic, linear or branched radical having from 2 to 20 carbon atoms, said carbon atoms being substituted by at least one fluorine atom and optionally by at least one hydrogen atom.

43. (New) A method according to claim 42, wherein said perfluorinated alcohol has the formula R^F-(CH₂)_m-OH, wherein R^F represents the group -C_sF_{2s}-CF₃ with s being equal to or different from zero or the group C_sF_{2s}H with s being equal to or more than 1, and m is a number from 0 to 10.

44. (New) A method according to claim 23, wherein said liquid silicone formulation further comprises a polycondensation catalyst.

45. (New) A method according to claim 23, wherein said liquid silicone formulation further comprises a filler.

46. (New) A method according to claim 23, wherein the liquid silicone formulation is first prepared in concentrated form, and is then diluted with an organic diluent, an organic solvent or water at the rate of 1 to 30 parts by weight of formulation per 100 parts by weight of solvent, diluent or water at the time of carrying out the coating step.

47. (New) A method according to claim 23, wherein the composition is directly applied to textile articles having at least one textile surface.

48. (New) A method according to claim 23, wherein the composition is applied to the threads, fibers and/or filaments during a process for the production of the textile material.